Spot Safety Project Evaluation

Project Log # 200505100

Spot Safety Project # 05-98-231

Spot Safety Project Evaluation of the Actuated Flasher installation at the intersection of SR 2215 (Buffaloe Rd.) and SR 2217 (Old Milburnie Rd.) in Wake Co.

Documents Prepared By:

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_____ 5/9/06
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Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 05-98-231 - Actuated Flasher installation at the intersection of SR 2215 (Buffaloe Rd.) and SR 2217 (Old Milburnie Rd.) in Wake County.

Project Information and Background from the Project File Folder

Both SR 2215 and SR 2217 are currently two lane, 45 mph facilities without left turn lanes. The intersection was controlled by a stop condition on SR 2217 with stop ahead and 48-inch stop signs at both approaches. Advance crossroad warning signs with 35 mph advisory speed plates were at both approaches on SR 2215 when approaching the intersection. Please note the speed limits for both routes was 55 mph before being reduced to 45 mph (SR 2215 reduced on 11/30/2001 and SR 2217 reduced on 2/16/2004).

The original problem statement was that motorists were running the stop condition on SR 2217. The spot safety project improvement countermeasure chosen for the subject location was the installation of an actuated flasher. The initial crash analysis was completed from 3/1/95 through 2/28/98 with 37 reported crashes, 22 were considered correctable by the installation of the actuated flasher. The final completion date for the actuated flasher installation at the subject intersection was on July 1, 1999 at a cost of $15,000.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes along the subject road, the crash data omitted from this analysis to consider for an adequate construction period was from June 1999 through August 1999. The before period consisted of reported crashes from June 1, 1997 through May 31, 1999 (2 years) and the after period consisted of reported crashes from September 1, 1999 through August 31, 2001 (2 Years). The ending date for this analysis was determined by the installation of a standard traffic signal in November 2001. The crash data from September and October 2001 was omitted to allow for an adequate construction period and due to the fact a full phase signal was recorded in the crash reports for both months.

The analysis consisted of the treatment data at the intersection of SR 2215 and SR 2217 with a 150' y-line. The following data table depicts the Naive Before and After Analysis for the above information. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. These crash types considered are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	19	22	15.8
Total Severity Index	21.2	5.4	-74.7
Frontal Impact Crashes	17	21	23.5
Frontal Severity Index	23.6	5.2	-77.9
Volume	10200	10700	4.9
Treatment Injuries			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	1	0	-100.0
Class A	3	0	-100.0
Class B	7	1	-85.7
Class C	4	12	200.0
Property Damage Only	4	9	125.0
Frontal Impact Injuries			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Fatal	1	0	-100.0
Class A	3	0	-100.0
Class B	7	1	-85.7
Class C	4	11	175.0
Property Damage Only	2	9	350.0

Table 1.

The naive before and after analysis at the treatment location resulted in a 16 percent increase in Total Crashes, a 24 percent increase in Frontal Impact Crashes, and a 5 percent increase in Average Daily Traffic (ADT). The Treatment Injuries resulted in a 100 percent decrease in Fatals, a 100 percent decrease for Class A, an 86 percent decrease for Class B, a 200 percent increase for Class C, and a 125 percent increase for Property Damage Only. The Frontal Impact Injuries resulted in a 100 percent decrease in Fatals, a 100 percent decrease for Class A, an 86 percent decrease for Class B, a 175 percent increase for Class C, and a 350 percent increase for Property Damage Only. The before period ADT year was 1998 and the after period ADT year was 2001.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 16 percent increase in Total Crashes and a 24 percent increase in Frontal Impact Crashes. The summary results above demonstrate that the treatment location appears to have had an increase in the number of Total Crashes and an increase in the number of Frontal Impact Crashes from the before to the after period.

Referencing the collision diagrams, the pattern of crashes were consistent from the before to the after period. Although the total number of crashes did not change significantly there was a considerable reduction in the severity of the injuries. The collision diagrams show lower speeds for vehicles crossing SR 2215 on SR 2217. This reduction in severity and speed may show that drivers are recognizing the stop condition on SR 2217.

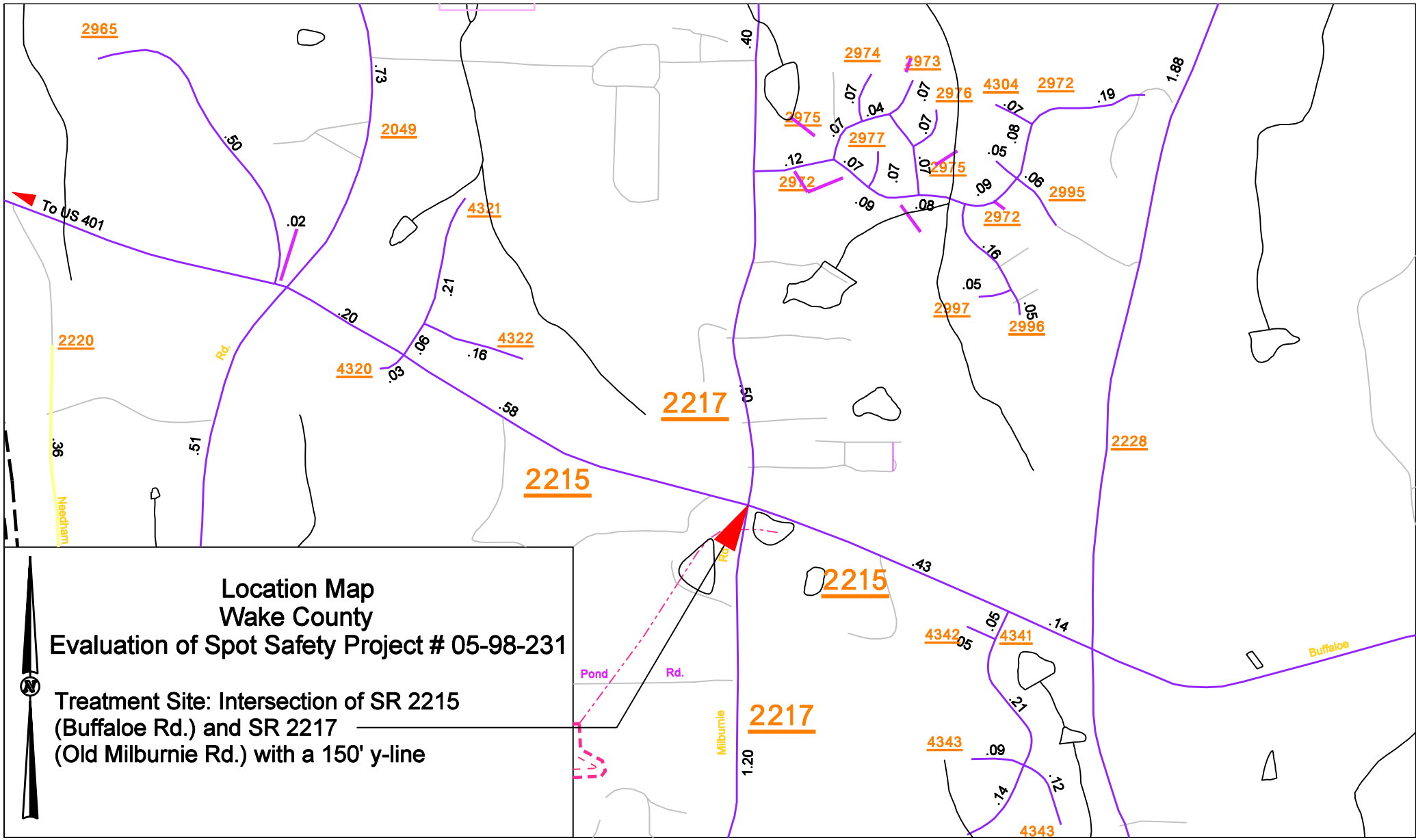
The frequency of crashes did not decrease from the before to the after period which may be a reason that a standard traffic signal was installed at the intersection. A separate crash report, collision diagram, and table is provided for the standard traffic signal crash data.

After Full Phase Signal 11/1/01 to 11/30/05			
Total crashes	14	Fatal	1
Total Severity Index	10.1	Class A	0
Frontal Impact Crashes	11	Class B	0
Frontal Severity Index	11.3	Class C	7
Volume	10700	Property Damage Only	6

Table 2.

Please note a fatal crash did occur after the signal was installed during the time period indicated in Table 2. Removing the fatal crash from the calculation, the Total Severity Index would be 4.98 and the Frontal Severity Index 4.7.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.


Location Map
Wake County
Evaluation of Spot Safety Project # 05-98-231
Treatment Site: Intersection of SR 2215
(Buffaloe Rd.) and SR 2217
(Old Milburnie Rd.) with a 150' y-line
To US 401
2965
2049
4321
4322
4320
2220
2974
2973
2976
4304
2972
2975
2977
2995
2997
2996
2228
2217
2215
Pond
Rd.
Milburnie
Buffaloe
Needham
4342
4341
4343

Treatment Site Photos Taken January 9, 2006

Driving east on SR 2215

Driving east on SR 2215

Driving east on SR 2215

Driving west on SR 2215

Driving west on SR 2215

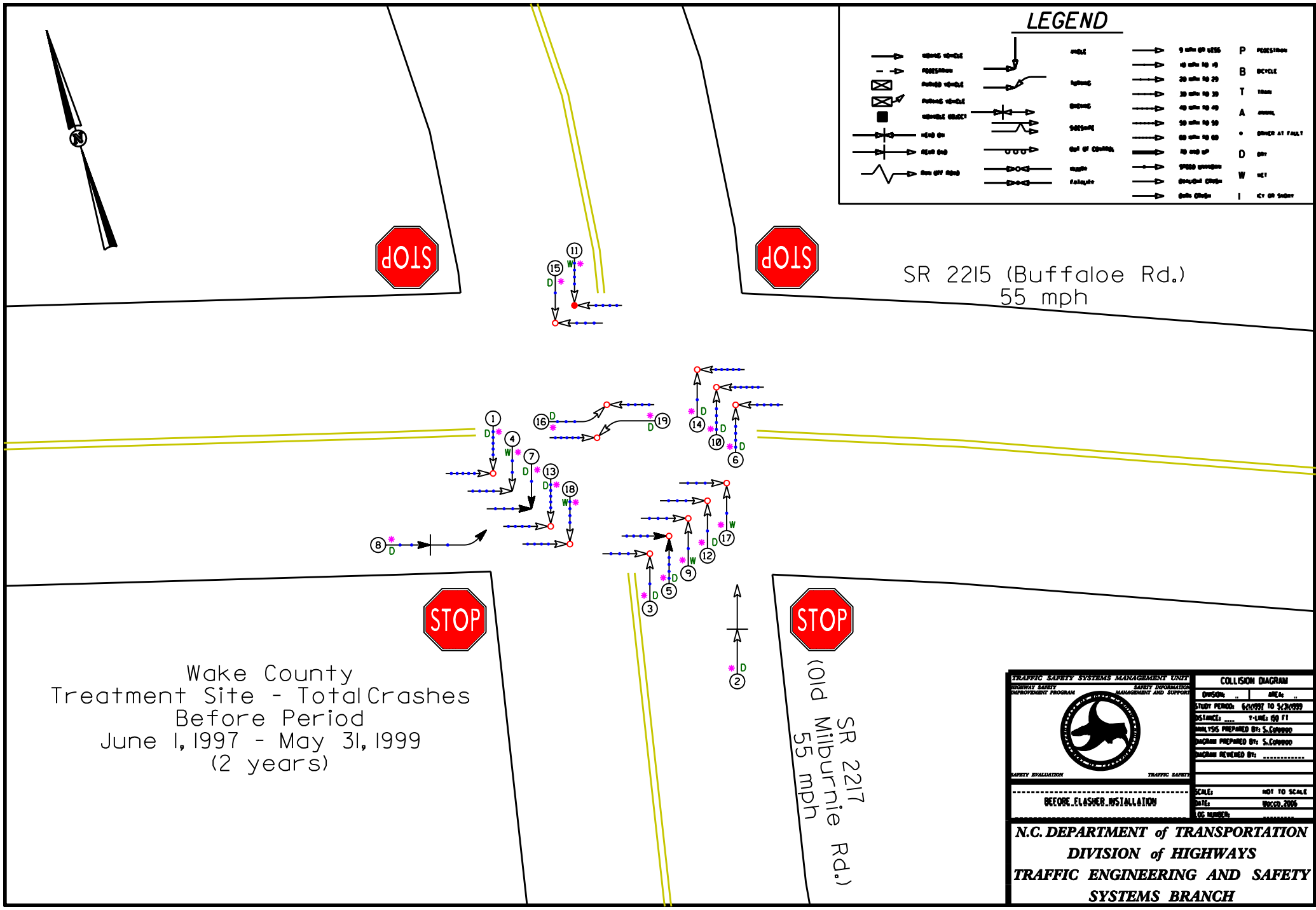
Looking west on SR 2215

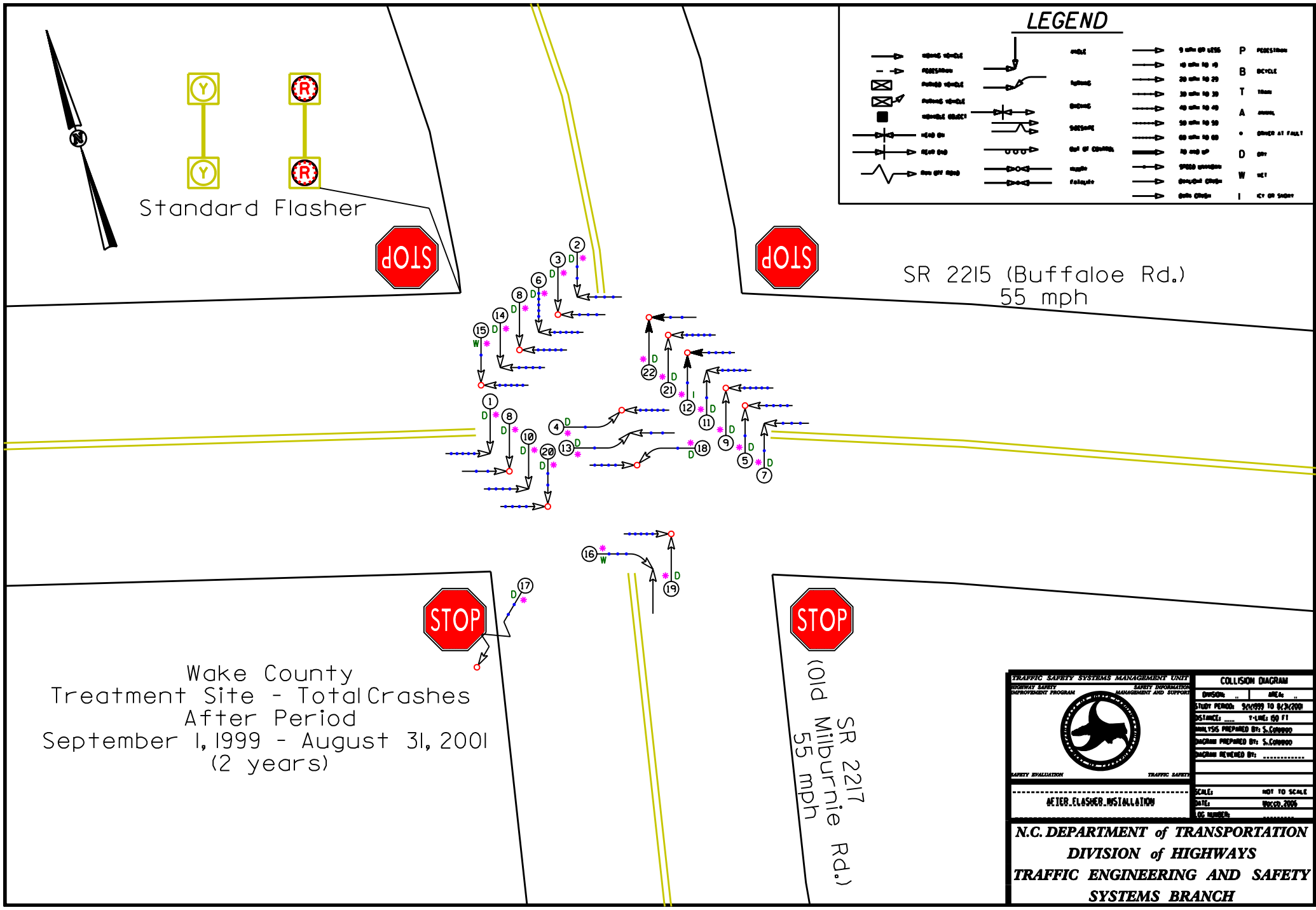
Looking north on SR 2217

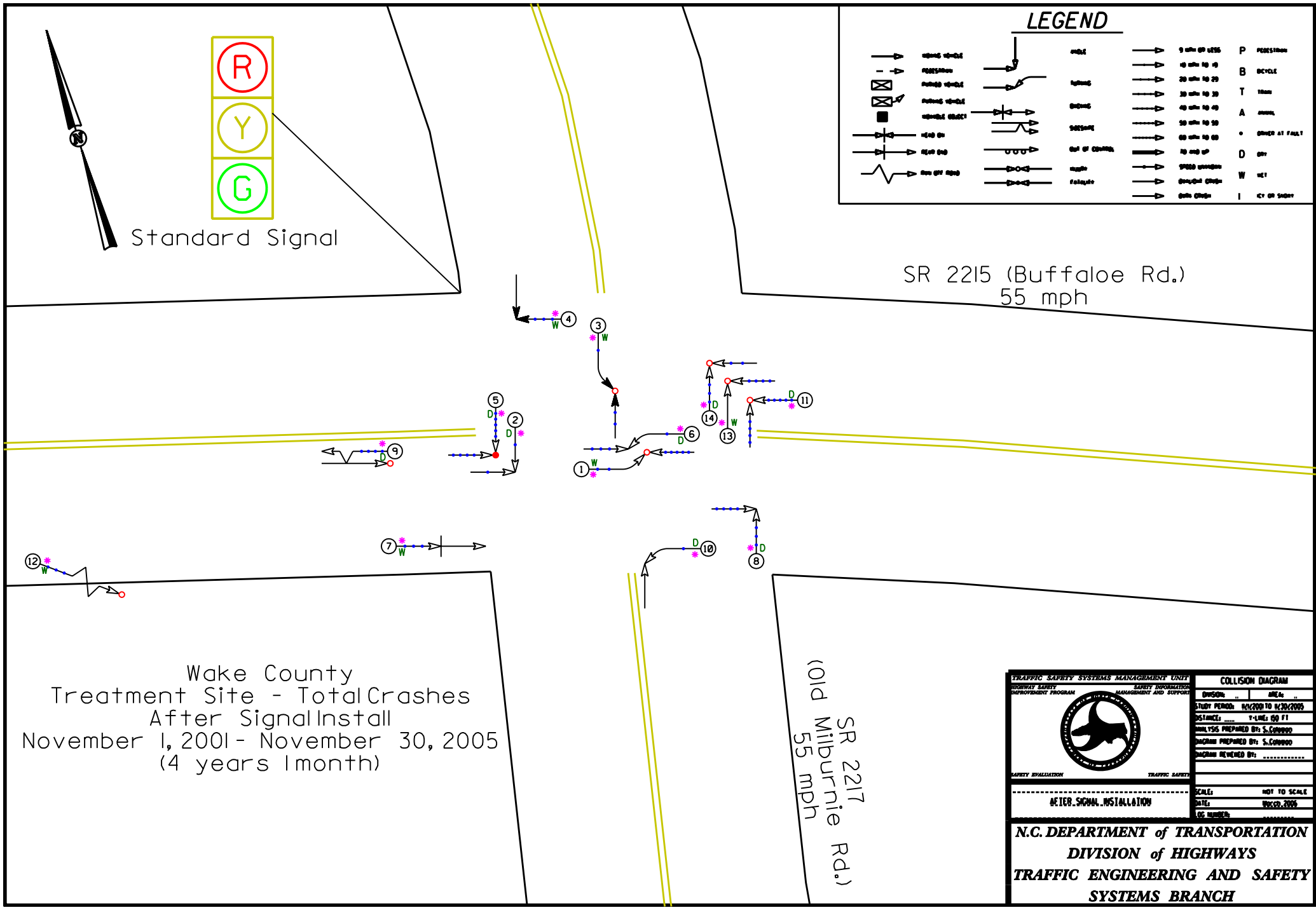
Looking east on SR 2215

Driving west on SR 2215

Looking south on SR 2217


LEGEND
STOP
STOP
SR 2215 (Buffaloe Rd.)
55 mph
STOP
STOP
SR 2217
(Old Milburnie Rd.)
55 mph
Wake County
Treatment Site - Total Crashes
Before Period
June 1, 1997 - May 31, 1999
(2 years)
TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT
HIGHWAY SAFETY IMPROVEMENT PROGRAM
SAFETY INFORMATION MANAGEMENT AND SUPPORT
SAFETY EVALUATION
TRAFFIC SAFETY
BEFORE.ELASHER.INSTALLATION
COLLISION DIAGRAM
SCALE: NOT TO SCALE
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH


LEGEND
Standard Flasher
STOP
STOP
SR 2215 (Buffaloe Rd.)
55 mph
STOP
STOP
SR 2217
(Old Milburnie Rd.)
55 mph
Wake County
Treatment Site - Total Crashes
After Period
September 1, 1999 - August 31, 2001
(2 years)
COLLISION DIAGRAM
AEIER FLASHER INSTALLATION
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH


LEGEND
Standard Signal
SR 2215 (Buffaloe Rd.)
55 mph
SR 2217
(Old Milburnie Rd.)
55 mph
Wake County
Treatment Site - Total Crashes
After Signal Install
November 1, 2001 - November 30, 2005
(4 years 1 month)
TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT
COLLISION DIAGRAM
AFTER SIGNAL INSTALLATION
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH